

# **SAHARA CRYSTAL** **SYSTEM**

**Document Number : SY-037-I0**

**Product Version : V1.2**

**BIOS Version : ML6108**

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# **FIC SAHARA DATABOOK DESKTOP PC PRODUCT SYSTEM TEST REPORT**

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**ABSTRACT:** This document states SAHARA CRYSTAL of system test requirements defined by international law, Specification and regulations as well as by FIC policy. It also summarizes FIC product test criteria required by many market-driven international environmental standards and government computer procurement guidelines.

**APPLICABILITY:** The system test reports contained in this document are applicable to desktop product are to be used by developers of SAHARA products and desktop office products, including FIC OEM lines.

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**Overview:**

This test report describes the test configuration of system, it must follow during Engineering / Design Validation Test (EVT/DVT) of the “SAHARA CRYSTAL 1.1 test plan”. The product focus at **FIC** Computer Corporation of business marketing, the development process assign to R&D of First International Computer Corporation. . All design function must meet customer request specification with “Microsoft WHQL Logo”, FIC specification if all test items had been finished and test result could be passed in the system compatibility, environment, stress, electrical performance, regulatory standards verification, mechanical, system power supply, DIMM qualification and final design review testing processed.

**Purpose:**

The testing process can provide a correct of reliability and stability system for demonstrate indentation, all problem solution or failure result will respond to customer and FIC R&D team. FIC will hold problem review meeting approximately once each week to review EVT/DVT status, define the debug team & assign corrective action.

The purpose of the Engineering/Design Verification Test (EVT/ DVT Test) is to demonstrate SAHARA CRYSTAL 1.1 can meet all functionality goals including all testing process, as stated in the engineering specification. Any problems and defects found during EVT test stage that should be documented, analyzed and betaken corrective action. After performing the test and reviewing the result from FIC R&D team. FIC will hold problem review meeting approximately once each week to review DVT status, define the debug team & assign corrective action. If we found the defects or bugs was found during the DVT test stage, we should do the tests again in nZXt cycle if the corrective active have been taken. Then we can provide the supported options work properly on the system, and the all shipment basic configuration unit can work properly. After the fixed bug could be closed by customer & FIC.

**Scope:**

The propose of this specification is to establish testing item, and procedure to ensure the safe operating, distribution, installation, and use if all FIC and OEM' s hardware product. It also provides criteria for all testing certification and rectification of all products.

The design specification applies all OEM' s supplied and optional for FIC manufactured finished products.

**Objectives:**

Ensure that both systems and peripherals meet the engineering specification under the appropriate environmental conditions as set forth in the product requirement document. This is to be accomplished through environmental standards tests.

Determine the design margins with respect to relevant variables as determined by the responsible engineers in the project team.

Ensure product meets FIC regulatory standards including EMC and safety requirements as we submit to regulatory compliance.

Make sure all problems found during the EVT/DVT are corrected and proceed to DVT/RM stage.



# 1. System Hardware

## 1.1 SYSTEM

### Basic configuration

<b>System</b>	<b>SAHARA 2000</b>		
<b>PCB version</b>	<b>1.2</b>		
<b>System NO.</b>	<b># 1</b>	<b># 2</b>	<b># 3</b>
<b>Processor</b>	Intel Pentium II 100MHZ bus serials base on Slot 1		
<b>Cache</b>	Base on CPU		
<b>BIOS Version</b>	AMI BIOS	AMI BIOS	AMI BIOS
<b>Power Management</b>	ACPI		
<b>Memory</b>	N/A		
<b>Chipset</b>	Intel 82443ZX	Intel 82443ZX	Intel 82443ZX
<b>PCIsset</b>	Intel 82371EB		
<b>VGA (Onboard)</b>	ATI RAGE LT PRO AGP 4MB A33	ATI RAGE LT PRO AGP 4MB A33	ATI RAGE LT PRO AGP 4MB A33
<b>LAN (Onboard)</b>	Intel SB82558B		
<b>Audio (Onboard)</b>	Crystal CS4280-CM PCI		
<b>Hardware Monitoring</b>	Winbond W83781D		
<b>I/O</b>	NS-351 Support Normal, EPP, ECP mode and IR interface		
<b>I/O Port</b>	1 DFP Port, 2 serial Port; 1 LPT; 1 VGA Port; 2 USB Channel; 1 Line-In; 1 Line-Out; 1 Mic-In		
<b>System Slot</b>	2PCI Slot x 1ISA Slot		
<b>HDD</b>	N/A		
<b>CD-ROM</b>	Panasonic CR-175B 24X		
<b>Floppy</b>	Mitsumi D353F3 1.44MB		

## 1.2 Main Board Feature

### 1.2.1 Solt 1

As SAHARA CRYSTAL spec., the CPU based on slot 1 support Pentium II 100 and Celeron 66 MHZ bus serials based on slot 1.

<b>Intel Processors</b>	<b>Status</b>
Pentium II 350MHz with 512KB cache	<b>PASS</b>
Pentium II 400MHz with 512KB cache	<b>PASS</b>
Pentium II 450MHz with 512KB cache	<b>PASS</b>
Pentium III 450MHz with 512KB cache	<b>PASS</b>
Pentium III 500MHz with 512KB cache	<b>PASS</b>
Pentium III 550MHz with 512KB cache	<b>PASS</b>
Celeron 400MHz with 128KB cache	<b>PASS</b>
Celeron 366MHz with 128KB cache	<b>PASS</b>



Celeron 333MHz with 128KB cache	PASS
Celeron 300MHz with 128KB cache	PASS

### 1.3 Jumper/Switches Function Verification

Description	Jumper/Switch Name	Default Option	Status
Power Switch	SW_1	Open	PASS
Power LED	Front Panel (One LED)	Open	PASS
IDE LED Connector	IDE_LED	Open	PASS
FDD LED	Front Panel (One LED)	Open	PASS
CPU FAN Connector	FAN	Open	PASS
Lan Card LED	LAN_LED	Open	PASS
Clear CMOS	CMOS_CLR	1-2	PASS
Front Panel	F_PNL	Open	PASS
Power Connector	Power Supply (90 Watt)	Open	PASS
HDD LED Power Connector	HDD_PW	Open	PASS
Clear Password Switch and Clear CMOS	CMOS_CLR	1-2	PASS
CPU Clock Rate	FREQ	1-2, 3-4, 7-8Close	PASS
BIOS EEPROM Select	EP1/EP2	1-2/2-3	PASS
Keyboard Power Select	KB_PWR	1-2/2-3	PASS
On-board VGA Function	VGA_DIS	1-2/2-3	PASS

### 1.4 Basic Function Test

#### 1.4.1 BIOS Feature Check

##### 1.4.1.1 Standard Level

Function	Test SPEC	Result
RTC Alarm	Must support day/hour/minute item Remote Power / ATX support	PASS
Device Auto Detect	Run auto detect function in BIOS	PASS
Floppy Drive A	1.44MB/Not Installed	PASS
Floppy 3 mode support	Enable BIOS' s floppy 3 mode function and Install floppy 3 mode device. Check it from Win' 95 and Win' 98 of Japan edition.	PASS

##### 1.4.1.2 High Level

Function	Test SPEC	Result
CD-ROM Boot	Install Win NT 4.0 in PS/SM/SS CD-ROM Must approval all CD-ROM vender & speed	PASS
USB Keyboard	Only use USB keyboard must can Into BIOS setup menu.(USB function not Enabled) Can only use USB keyboard in DOS Mode? USB keyboard can into suspend & Wake up. (ACPI BIOS)	PASS



Modem Ring Up	COM 1 / COM 2 support Remote Power / ATX support	PASS
System / CPU Thermal	Instrument Test Function default suggest Disabled Hardware Monitor support LDCM test. CPU/Chassis FAN test Clock slow down test	PASS
RTC Alarm	Must support day/hour/minute item Remote Power / ATX support	PASS
LAN wake up	BIOS support LAN wake up function. (Wake up from suspend,Wake up from power off)	PASS
System DMI	DMI Utility for DOS LDCM 3.3 for Win 95 / Win98 / NT4 .0	PASS
PS/2 Mouse & IRQ 12	IRQ 12 can free when system no use PS/2 mouse	PASS
Auto Shutdown	Auto Power Off in Win 95/98 shutdown Remote Power / ATX support	PASS
Remote Power Switch	One touch / 4 second Remote Power / ATX support	PASS
Power Management	All OS test → H/W suspend switch / Suspend item / Time out test Modem Wake up	PASS
Ultra DMA/33 HDD	Can be detect in booting Install chipset IDE bus master driver.	PASS
Boot Full Screen Logo	Press "Delete" into BIOS setup	PASS
Year 2000	Run Year2000 program in DOS mode	PASS

**1.4.1.3 BIOS FEATURE LEVEL**

Function	Test SPEC	Result
Detect Boot Virus By Trend	Enable/Disable	PASS
CPU Internal Cache	Enable/Disable	PASS
Zxternal Cache	Enable/Disable	PASS
Quick Power On Self Test	Enable/Disable	PASS
Boot From LAN First	Enable/Disable	PASS
Boot Sequence	A,C/C,A/A,CD-ROM,C/CD-ROM,C,A/ C Only	PASS
Boot Up NumLock Status	Keyboard Num Lock LED ON/OFF	PASS
Security Option	Setup/System 2.H/W CPW jumper test	PASS
PS/2 Mouse Function Control	Disable/Enable	PASS
O/S Select For DRAM > 64MB	OS2/ Non-OS2	PASS
Video BIOS Shadow	Enable/Disable	PASS

**1.4.1.4 CHIPSET FEATURE LEVEL**

Function	Test SPEC	Result
8 Bit I/O Recovery Time	8, 7, 6, 5, 4, 3, 2, 1, NA	PASS
16 Bit I/O Recovery Time	4, 3, 2, 1, NA	PASS
Memory Hole At 15M-16M	Enable/Disable	PASS
Spread Spectrum	Enable/Disable	PASS



CPU Warning Temperature	Disable; 50C/122F; 53C/127F; 56C/133F; 60C/140F; 63C/145F; 66C/151F; 70C/158F	PASS
Alert On Lan Function	Flash EEPROM	Pass

#### 1.4.1.5 POWER MANAGEMENT LEVEL

Function	Test SPEC	Result
Power Management	Max Saving/ Min Saving/ User Define	PASS
PM Control by ACPI	Yes/No	PASS
Video off Method	V/H SYNC+Blank; Blank Screen;DPMS	PASS
Video Off After	NA/Doze/Standby/Suspend	PASS
Modem Use IRQ	3, 4, 5, 7, 9, 10, NA	PASS
Standby Mode	1hrs;40min;30min;20min;12min;8min;4min;2min;2min;1min;Disable	PASS
Suspend Mode	1hrs;40min;30min;20min;12min;8min;4min;2min;2min;1min;Disable	PASS
HDD Power Down	1min;2min;3min;4min;5min;6min;7min;8min;9min;10min;11min;12min;13min;14min;15min	PASS
Throttle Duty Cycle	12.5%;25.0%;37.5%;50.0%;62.5%;75.0%	PASS
VGA Active Monitor	Enable/Disable	PASS
Soft-Off By PWR-BTTN	Instant-off/Delay 4 sec.	PASS
CPUFAN off In Suspend	Enable/Disable	PASS
Resume By Ring	Enable/Disable	PASS
Resume By LAN	Enable/Disable	PASS
Resume By Alarm	Enable/Disable	PASS
Primary IDE 0	Enable/Disable	PASS
Secondary IDE 1	Enable/Disable	PASS
Floppy Disk	Enable/Disable	PASS
Serial Port	Enable/Disable	PASS
Parallel Port	Enable/Disable	PASS

#### 1.4.1.6. PCI/PnP LEVEL

Function	Test SPEC	Result
PnP OS Installed	Yes/No	PASS
Resources Controlled	Auto/Manual	PASS
Reset Configuration Data	Enable/Disable	PASS
Slot 1 Use IRQ No.	IRQ 3, 4, 5, 7, 9, 10, 11, 12, 14, 15/Auto	PASS
Slot 2 Use IRQ No.	IRQ 3, 4, 5, 7, 9, 10, 11, 12, 14, 15/Auto	PASS
Audio Use IRQ No.	IRQ 3, 4, 5, 7, 9, 10, 11, 12, 14, 15/Auto	PASS
PCI IRQ Activate	Level / Edge	PASS
Init Primary Display PCI	PCI/VGA	PASS
Assign IRQ For VGA	Enable / Disable	PASS

#### 1.4.1.7 PERIPHERAL LEVEL

Function	Test SPEC	Result
USB Controller	Enable/Disable 2.Run USB device in DOS/Win 98 USB device & ACPI function	PASS
OnBoard FDC Controller	Enable/Disable	PASS





OnBoard Serial PortA	2E8h/IRQ3; 3E8h/IRQ4; 2F8h/IRQ3; 3F8h/IRQ4 and Auto 2.Check them with serial mouse and ZXternal modern	<b>PASS</b>
OnBoard Serial PortB	2E8h/IRQ3; 3E8h/IRQ4; 2F8h/IRQ3; 3F8h/IRQ4 and Auto 2.Check them with serial mouse and ZXternal modern	<b>PASS</b>
OnBoard Parallel Port	378/IRQ7; 3BCh/IRQ7; 278h/IRQ5; Disable 2.Check them with printer 3.Check them with Scanner in ECP mode	<b>PASS</b>
Parallel Port Mode	SPP/EPP/ECP/ECP+EPP	<b>PASS</b>
ECP Mode Use DMA	DMA:1;3 2.Check them with scanner	<b>PASS</b>

## 1.4.2 RTC Test

Check the 14.318 MHZ frequency accuracy while power on and no sacrifice to performance. The 32.768KHZ crystal will be checked by means of read BIOS SETUP time/date after power-off. Test result must meet the concerning component specification. The 50 ppm tolerance is our goal of accuracy but not a design specification.

### 1.4.2.1 Test Enviroment

Test Item	Test Enviroment	Test Spec.	Result
Power On	O.S. Mode ( Win95/Win98/WinNT)	< 2 sec; 24Hr	<b>PASS</b>
	DOS Mode	< 2 sec; 24H	<b>PASS</b>
	BIOS Mode	< 2 sec; 24H	<b>PASS</b>
Power Off	AC Power	< 2 sec; 24H	<b>PASS</b>
	Remove AC Power	< 2 sec; 24H	<b>PASS</b>

## 1.5 Onboard Funmental Function Test ( VGA; LAN; Audio)

### 1.5.1 VGA Function Test

#### 1.5.1.1 Configuration

We check onboard ATI AGP VGA funtion under below condition:

<b>System</b>	<b>SAHARA CRYSTAL</b>			
<b>PCB version</b>	<b>1.2</b>			
<b>System Configuration</b>	<b># 1-1</b>	<b># 2-1</b>	<b># 3-1</b>	<b># 3-2 ( Compare)</b>
<b>Processor</b>	Pentium II 450MHz			
<b>Cache</b>	512K			
<b>SDRAM</b>	64MB			
<b>BIOS Version</b>	AMI BIOS ML612	AMI BIOS ML612	AMI BIOS ML612	
<b>VGA Chip</b>	ATI Rage LT PRO AGP 4MB A33	ATI Rage IIC AGP 4MB A21	S3 Virgel/DX PCI Adapter	
<b>VGA driver</b>	ATI VGA driver 5.35	ATI VGA V5.24	Win98 Default	



O.S.	Win98 (English)
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## 1.5.1.2 Test Utilities

Test Utility	Version	Language	Status
Final Reality	1.01	English	PASS
3D Winbench99	1.0	English	PASS
3D Winbench99	1.0	English	PASS
CD Winbench99	1.0	English	PASS

## 1.5.1.3 Test Condition

All test condition will be ZExecuted on Win98 under display setting all supprot resolution & depts.

Test Condition	Driver Version	Language	Status
Resolution with Color Depts Change Test	V5.35 for Win95/98	English	PASS
Resolution with Color Depts Change Test	V5.30 for Win NT 4.0	English	PASS

## 1.5.1.4 Test Item

## 1.5.1.4.1 Finally Reality Test

ITEM		RAGE LT Pro	RAGE IIC	S3
3D Performance	25 pixel	322.42 Kpolys/s	74.25 Kpolys/s	64.63 Kpolys/s
	Robots	36.77 Kpolys/s	3.69 Kpolys/s	7.07Kpolys/s
	Fill Rate	47.83 Kpolys/s	8.95 Mpixel/s	8.14 Mpixel/s
	City scene	36.57 images/s	5.05 images/s	8.01 images/s
	Visual appearance	100%	88.89%	74.07%
2D Performance	Radial blur	46.11 images/s	28.61 images/s	29.22 images/s
	Chaos zoomer	71.81 images/s	43.55 images/s	43.90 images/s
Bus transfer Rate	2D transfer rate	126.13 Mbytes/s	67.40 Mbytes/s	81.93 Mbytes/s
	3D transfer rate	17.68 Mbytes/s	49.74 Mbytes/s	59.55 Mbytes/s

## 1.5.1.4.2 3D Graphics Quality Test (Under 3D WinBench 99)

: PASS : NO SUPPORT :INCORRECT

NO.	ITEM	Test Configuration		
		# 1	# 2	# 3
1	Flat Shading			
2	Gouraud Shading			
3	Dithering			
4	Z-Buffer			
5	Perspective Correction			
6	Nearest			
7	Linear			
8	Nearest Mipmap Nearest			



9	Nearest Mipmap Linear			
10	Linear Mipmap Nearest			
11	Linear Mipmap Linear			
12	Mipmap LOD Bias			
13	Modulate TZTexture Blending			
14	Decal TZTexture Blending			
15	DecalAlpha TZTexture Blending			
16	ModulAlpha TZTexture Blending			
17	Flat Wrap TZTexture Addressing			
18	Cylindrical Wrap U			
19	Cylindrical Wrap V			
20	Clamp TZTexture Addressing			
21	Mirror TZTexture Addressing			
22	Cull Counterclockwise			
23	Cull Clockwise			
24	Cull None			
25	Fog VertZX Linear			
26	Fog Table Linear			
27	Fog Table ZXponential			
28	Specular Highlights			
29	Color Key Transparency			
30	Alpha Transparency			
31	Source Alpha Pixel Blending			
32	Add Pixel Blending			
33	Modulate Pixel Blending			
34	Modulate 2x Pixel Blending			
35	Alpha Vertices			
36	Perspective Correct Alpha			
37	Alpha Comparison Greater Than			
38	Alpha Comparison Greater Than or Equal			
39	Alpha Comparison Less Than			
40	Alpha Comparison Less Than or Equal			
41	Z Comparison Greater Than			
42	Z Comparison Greater Than or Equal			
43	Z Comparison Less Than			
44	Z Comparison Less Than or Equal			
45	Z Accuracy			
46	Z Bias			
47	Anti-Aliasing 640x480			
48	Triangle Rasterization			
49	TZTexture Fidelity			
50	TZTexture Swapping			
51	High Triangle Count			



52	Fog VertZX and Color Key			
53	Fog VertZX and Alpha			
54	Alpha and Linear			
55	Alpha and Linear Mipmap Linear			
56	Small Triangles			
57	Perspective Correct Color			
58	Perspective Correct Specular			
59	Anti-Aliasing 1024x768			

**1.5.1.4.3 3D Benchmark Test (Under 3D WinBench 99)**

ITEM	RAGE LT Pro	RAGE IIC	S3
3D Processing	19.1	7.91	9.07
3D WinMark	226	70.6	68.1

**1.5.2 Onboard LAN Function Test****1.5.2.1 Configuration**

We check onboard Intel S82558B LAN function under below condition:

<b>System</b>	<b>SAHARA CRYSTAL</b>
<b>PCB version</b>	<b>1.2</b>
<b>Processor</b>	Pentium II 450MHz
<b>Cache</b>	512K
<b>SDRAM</b>	64MB (Full Loading)
<b>LAN Chip</b>	Intel S82558B
<b>LAN driver</b>	Intel 82558B Lincard driver 1.10
<b>Utility</b>	LCM Server; LDCM 3.3

**1.5.2.2 LCM Server Test Result**

We only check onboard LAN function in LCM server. All tests will be ZXcuted by network team engineer **TEDDY**.

Description	Test Result
Install Win95 from LCM server	PASS
Remote shutdown system from LCM server ( Twice )	PASS
Remote wakeup system from LCM server ( Twice )	PASS
NetBench 5.01 Client test under Win95 ( 24H )	PASS
IE 4.0 under Win95 test	PASS
Receive/ Send mail test	PASS
Install WinNT 4.0 from LCM server	PASS
Remote shutdown system from LCM server ( Twice )	PASS
NetBench 5.01 Client test under Win95 ( 24H )	PASS



IE 4.0 under Win95 test	PASS
Client 32 for NT 4.40.526	PASS
Netscape 4.04	PASS
Receive/ Send mail test	PASS
Install Win98 from LCM server	PASS
Magic Frame test: Buttom suspend wake-up ( Hardware )	PASS
Magic Frame test: Win95 suspend wake-up ( Software )	PASS
Magic Frame test: Time out suspend wake-up ( PM )	PASS
Magic Frame test: Power off wake-up	PASS
Alert On Lan Test : Remote Wake-up on Lan	PASS
Alert On Lan Test : Chassis Intrusion	PASS
Alert On Lan Test: System unplugged from network	PASS
Alert On Lan Test: Processor removal	PASS
Alert On Lan Test: Voltage fluctuations	PASS
Alert On Lan Test: Operating system errors	PASS
Alert On Lan Test: System power-on errors	PASS
Alert On Lan Test: System is hung	PASS
Alert On Lan Test: System environmental errors	PASS

#### 1.5.2.3 Dynamic Testm (LDCM 3.3)

We install LDCM 3.3 in system and modify administrator and local PC. From this, we could make sure the Network work properly advanced throughout transfer and receive procedure.

Role Play	Check Item	Test Congiguration
Administrator	Transfer files to and from client workstation	PASS
	Remotely reboot client workstation	PASS
	Shutdown local system	PASS
	Waking up a computer	PASS
Local PC	Transfer files to and from administrator	PASS
	Reboot by administrator	PASS
	Shutdown by administrator	PASS
	Waking up by administrator	PASS

### 1.5.3 Onboard Audio Function Test

#### 1.5.3.1 Configuration

We check onboard Intel S82558B LAN function under below condition:

System	SAHARA CRYSTAL
PCB version	1.2
Processor	Pentium III 450MHz
e	512K



<b>SDRAM</b>	64MB (Full Loading)
<b>Audio Chip</b>	Crystal CS428-CM ISA
<b>Audio driver</b>	Crystal 4280 sound driver 4.10.1.3010
<b>O.S.</b>	Win98

### 1.5.3.2 Manual Test

Test Item	Description	Test Configuration
Recording Test	Did the file play back correctly, comparing favorably in sound quality to the original source material from the CD for all OS?	PASS
Recording Control Verification	Do all sliders and controls function correctly in Recording mode for all OS?	PASS
Mixing Multiple Input Lines	Do all sliders and controls function correctly while multiple input lines are mixed together for all OS?	PASS
Retention of Setting	Are changed settings saved each time for all OS?	PASS
Volume Control Icon	Does the Volume Control icon appear on the taskbar when Show Volume Control On the Taskbar option is enabled for all OS?	PASS
Multimedia Control Panel Verification	Is the Test adapters base audio driver listed in both the playback and recording combo boxes for all OS?	PASS
Other Drivers	Do all Test adapter's devices appear in the list in the proper locations for all OS?	PASS
.AVI Files	Could .AVI files be played successfully for all OS?	PASS

### 1.6 Base Operating Systems Certification Tests

Operating System	Company	Utility	Result
DOS 6.22	Microsoft	QAPLUS 5.52	PASS
Test Configurations	Intel Pentium II 400MHz Intel PRO 100 PCI Network card ATI Rage LT PRO AGP 4MB SGRAM on board VGA(Default) 64MB SDRAM Memory Seagate BALI ST-36531A 6.4GB IDE HDD		
DOS 6.22	Microsoft	Amidiag 5.50	PASS
Test Configurations	Intel Pentium II 450MHz Intel PRO 100 PCI Network card ATI Rage LT Pro AGP 4MB SGRAM on board VGA(Default) 64MB SDRAM Memory Seagate BALI ST-36531A 6.4GB IDE HDD		
Windows NT Version 4.00	Microsoft	Window NT HCT 8.0	PASS
Test Configurations	Intel Pentium III 550MHz Intel PRO 100 PCI Network card ATI Rage LT Pro AGP 4MB SGRAM on board 64MB SDRAM Memory Seagate BALI ST-36531A 6.4GB IDE HDD		



Windows 98 ACPI mode	Microsoft	Window 98 HCT 8.0	PASS
Test Configurations	Intel Pentium III 500MHz Intel PRO 100 PCI Network ATI Rage LT Pro AGP 4MB SGRAM on board 64MB SDRAM Memory Seagate BALI ST-36531A 6.4GB IDE HDD		
Windows NT 5.0 ACPI mode	Microsoft	Window 98 HCT 8.0	PASS
Test Configurations	Intel Pentium II 450MHz Intel PRO 100 PCI Network ATI Rage LT Pro AGP 4MB SGRAM on board 64MB SDRAM Memory Seagate BALI ST-36531A 6.4GB IDE HDD		

## 2. Stability & Reliability Test

### 2.1 Dynamic Burn-in Tests

#### 2.1.1 Test Configuration

Processor	Intel Pentium III 500 MHZ
Cache	512K
Memory	128MB (Full Loading)
Chipset	Intel 82443ZX
PCIsset	Intel 82371EB
VGA (Onboard)	ATI Rage LT Pro AGP 4MB SGRAM
LAN (Onboard)	Intel SB82558B
Audio (Onboard)	Crystal CS4280-CM PCI

#### 2.1.3 Test Utilities

Software Name	Duration	Test Condition
Novell Server version 4.11	24 hr.	A
SCO UNIX Open Desktop 5.0.4	24 hr.	A
Qaplus 5.22 in DOS 6.22	12 hr.	HIJKL
Bapco 4.0 in WinNT 4.0	12 hr.	ADEL
WinBench98 in Win95 OSR 2.5	12 hr.	ACHL
HCT 8.0 stress test in Win98	12 hr.	DEJKL
VCD play in Win98	12 hr.	ABEF
Audio play in Win98	12 hr.	ABEF

## 2.2 Software Reboot Tests

The test is to ensure the SAHARA CRYSTAL system power on in-rush current will not cause any damage The test will describe as follow the table list:

The Power On/Off and Reboot Cycle test process included the list, please see below:



The unit will keep running power cycles over night. Power cycles are defined as boot to operating system and then restart system up to 500 times. Any error occurred during the cycle will be logged.

“ONOFFVE” program is intended to be used on PC with a PIIX4 On/OFF controller .The RTC alarm is enabled 10 seconds later as a ON event, and then the system is powered off.

### 3. Hardware Compatibility Test Suite

#### 3.1 Memory Module (SDRAM)

##### A. PC100 DIMM

Vender	IC Part No.	ECC	Side	Module No.	Result
<b>32MB 2MX64</b>					
SEC	KM48S2020CT-GL	No	D	KMM36S403CT-GL	PASS
FUJITSU	81F16822B-102FN	No	D	321608S26FJ01	PASS
<b>32MB 4MX64</b>					
FUJITSU	81F641642C-102FN	No	S	320416S26FJ12	PASS
HITACHI	HM5264165TTB60	No	S	320416S36HI01	PASS
<b>32MB 8MX32</b>					
MITSUMI	M5M4V64S40ATP	No	S	320416S36MI01	PASS
FUJITSU	81F641642C-102FN	No	S	320416S26FJ12	PASS
FUJITSU	81F641642B-133FN	No	S	3200416S36FI11	PASS
SEC	KM416S4030BT-GH	No	S	320416S26SA01	PASS
NEC	D4564163G5-A10-9JF	No	S	MC-454CB646F-A10	PASS
<b>64MB 8MX64</b>					
SEC	KM48S8030BT-GH	No	S	640808S26SA11	PASS
LGS	GM72V66841GT7J	No	S	18187321-ITA	PASS
HITACHI	HM5264805TTB60	No	S	640808S36HI01	PASS
FUJITSU	81F64842B-103FN	No	S	640808S36FJ01	PASS
<b>128MB 16MX64</b>					
SEC	KM48S8030BT-GH	No	D	1281608S26SA11	PASS
NEC	D4564841G5-A10-9JF	No	D	1281608S36NE01	PASS
FUJITSU	81F64842B-103FN	No	D	1281608S36FJ01	PASS
HITACHI	HM5264805TTB60	No	D	1281608S36HI01	PASS

#### 3.2 Add-on Cards

##### 3.2.1 SCSI Adapter Products

Vendor	Model Name	Product Description	Bus I/F	Result
Adaptec	AHA-2940UW	Adaptec AHA-2940UW PCI SCSI card	PCI	PASS
BusLogic	FlashPoint LT	Buslogic BT-930 PCI SCSI	PCI	PASS
Symbios	SYM875-1SP	Symbios Logic 53C875J	PCI	PASS

##### 3.2.2 FAX / Modem Products





Vendor	Model Name	Bus I/F	Result
HAYES	HAYES 56K/14.4 Data/Fax Modem	Internal	PASS
US Robotics	Sportster ZXternal 56K Data/Fax Modem	Internal	PASS
Motorola	ZXternal v0.90 56K Modem	Internal	PASS

### 3.2.3 Network Card Products

Vender	Model	Ver.	Chips No.	Specification	Bus	Result
3COM	3C590	A	3COM40-0196	ETHERNET 10MB	PCI	PASS
	3C905B	B		ETHERNET 10/100 MB	PCI	PASS
ACCTON	EN1207	A	MPX EN5038	ETHERNET 10/100 MB	PCI	PASS
Realtek	LAN-100TX	A	RTL8139A	Ethernet 10/100 MB	PCI	PASS
IBM	4H8098	A	38H6302	TOKEN RING 4/16 MB	PCI	PASS
INTEL	PRO10+	004	INTEL S82557	ETHERNET 10MB	PCI	PASS
	PRO100+	A	INTEL S82559	ETHERNET 10/100 MB	PCI	PASS
OLICOM	OC-3136	5	OLICOM119000022	TOKEN RING 4/16MB	PCI	PASS
	OC-4048	F	TI 380PCIPCW	TOKEN RING 4/16MB	PCI	PASS

## 3.3 Storage

### 3.3.1 SCSI Peripheral Products

ITEM	Vendor	Model Name	Product Description	Result
SCSI Hard Disk	Quantum	TM2110S	2.1GB SCSI Hard Disk Drive	PASS
		Atlas II	4.5GB Ultra SCSI HDD	PASS
	Seagate	ST-32550W	2GB Wide SCSI Hard Disk Drive	PASS
	IBM	DCAS34330	4.5GB Ultra SCSI HDD	PASS
	WD	WDE2170	4.3GB Ultra Wide SCSI HDD	PASS
CD-ROM	PIZXtor	PX-32Tsi	32X Ultra SCSI CD-ROM	PASS
	Pioneer	DR-533	24X Narrow SCSI II CD-ROM	PASS
MO	Fujitsu	M2512A2	Internal 50 Pin	PASS
Iomega	Ditto	IO80Fi	Ditto Driver 800 Tape Insider	PASS
		IO80-PX3	Ditto Easy 800 ZXternal Tape Driver	PASS
	Zip	Z100S	Zip 100 SCSI	PASS
	Jaz	V1000SI	Jaz 1GB SCSI	PASS

### 3.3.2 IDE Fixed Disk Drive Products

Vendor	Model Name	Mode	Capacity	Result
Quantum	Fireball ZX10200 AT	Ultra DMA 33	10.1GB	PASS
Seagate	U2 ST-33223A	Ultra DMA 33	3.2GB	PASS
	BALI ST-36531A	Ultra DMA 33	6.4GB	PASS
	Medalist 6531 ST36531A	Ultra DMA 33	6.4GB	PASS
	Medalist 8641 ST38641A	Ultra DMA 33	8.4GB	PASS
Western Digital	WD24300	Ultra DMA 33	4.3GB	PASS
	WD26400	Ultra DMA 33	6.4GB	PASS
	WD28400	Ultra DMA33	8.4GB	PASS

### 3.3.3 ATAPI CD-ROM Device Product

Vendor	Model Name	Product Description	Bus I/F	Result
Mitsumi	SR242S	ATAPI CD-ROM Device 24X	IDE	PASS
Panasonic	UJDA170	ATAPI CD-ROM Device 24X	IDE	PASS
	UJDA190	ATAPI CD-ROM Device 24X	IDE	PASS
	SR-8171	DVD-ROM Device (F/W:058A ONLY)	IDE	PASS

## 3.4 Peripherals

### 3.4.1 Printer Peripheral Products

Vendor	Model Name	Product Description	Bus I/F	Result
HP	LaserJet III	HP LaserJet III	LPT	PASS
	LaserJet 5P	HP LaserJet 5P support IR Interface	LPT	PASS
Zip	ZIP100	Iomega ZIP 100 Parallel port	LPT	PASS
LEO	LEO 300 ECP	LEO LPT scanner Scan-S6	Printer/ECP	PASS
	LEOScan	LEO ECP FS-1130A Scanner	Printer/ECP	PASS

### 3.4.2 Mouse Products

Vendor	Model Name	Product Description	Bus I/F	Result
Microsoft	Microsoft Mouse	Microsoft IntelliMouse Serial - PS/2 Mouse	Serial/PS2	PASS
Logitech	MouseMan	Logitech MouseMan Serial - PS/2 Mouse	Serial/PS2	PASS
	First Mouse+	Logitech First Mouse+ Serial - PS/2 Mouse	Serial/PS2	PASS
	TrackMan Marble	Logitech TrackMan Marble Serial - PS/2 Mouse	Serial/PS2	PASS

### 3.4.3 USB Device Products

Type	Vendor	Parts No	Description	Result
Mouse	Logitech	M-UA35	USB Mouse	PASS
	DZXIN	MA2R	USB Mouse	PASS
	Cypress		USB Mouse	PASS
HUB	Belkin	ZXpress Bus F5U001	USB HUB	PASS
Camera		PC Camera U-CAM	USB Camera	PASS
Faxmodem	US Robotics	56K Voice Faxmodem	USB Faxmodem	PASS
Keyboard	BTC	BTC8113 ACPI	USB Keyboard	PASS
	Chicony	KU-8933	USB Keyboard	PASS
Joystick	Paramount		USB Joystick	PASS

## 4. Software Compatibility Test Suite

### 4.1 Base Operating System

The board is tested to ensure that it runs a complete a RAGE of Operating Systems and thus operate in all network environments The board' s Power Management and Remote functions are also tested.

Operating System	Version	Language	Company	Status
MS DOS Ver 6.22	6.22	English	Microsoft	PASS
MS Windows 95 OSR2.5	950C	English	Microsoft	PASS
MS Windows 98	1998	English	Microsoft	PASS
Windows NT Workstation	4.0	English	Microsoft	PASS
Windows 2000	5.0 Beta 3	English	Microsoft	PASS
IBM OS/2 Warp	4.0	English	IBM	PASS
Novell Network	3.12	English	Novell	PASS
Novell Network	4.10	English	Novell	PASS
Novell Network	4.11	English	Novell	PASS
Linux	5.2	English	Rad Hat	PASS

## 4.2 Software Applications

Item	Descriptions	Version	O.S.	Language	Status
Communication	BITWare	3.30	Windows 95	English	PASS
	WinFAX Pro for Win 95	4.0	Windows 95	English	PASS
	LapLink	7.0A	Windows 95	English	PASS
Browser	Internet ZXplorer	4.01	Windows 95	English	PASS
	Internet ZXplorer	3.02	Windows NT4.0	English	PASS
Database	Approach 96	1.0	Windows 95	English	PASS
	Lotus Notes	4.0	Windows 95	English	PASS
	Borland Visual Dbase	5.5	Windows 95	English	PASS
	Visual Foxpro	3.0A	Windows 95	English	PASS
Database	Visual dBASE Compiler	5.5	Windows 95	English	PASS
	Borland Delphi	3.0	Windows 95	English	PASS
	FoxPro Microsoft	5.0	Windows 95	English	PASS
Program	MS Visual Basic	5.0	Windows 95	English	PASS
	MS Visual C++	4.0	Windows 95	English	PASS
	Borland Delphi	2.0	Windows 95	English	PASS
Suites	Lotus SMART Suites 96	1.0	Windows 95	English	PASS
	MS Work for Windows	3.0	Windows	English	PASS
	MS Work for Windows95	4.0	Windows 95	English	PASS
	MS Office for Windows	4.3	Windows	English	PASS
	MS Office for Windows	4.3	Windows	Chinese	PASS
	MS Office 97 for Windows95	7.0	Windows 95	English	PASS
TimeManagement	MS Project	4.1	Windows 95	English	PASS
	Organizer	2.1T	Windows	Chinese	PASS
Tools	Norton Ghost	4.0	DOS	English	PASS
	Norton Ghost	5.0	Windows9x	English	PASS



	Anti-virus for Win95	3.0	Windows 95	English	<b>PASS</b>
	Xing Soft MPEG Player	3.0	Windows 95	English	<b>PASS</b>
	Xing DVD Play	1.0b	Windows98	English	<b>PASS</b>
	Norton Backup	2.2	Windows	English	<b>PASS</b>
	Norton Commander	5.0	DOS	English	<b>PASS</b>
	Norton Utility	9.0	Windows 95	English	<b>PASS</b>
	Microsoft Plus!	1.0	Windows 95	English	<b>PASS</b>
Word Processor	PE III (DW3)	4.0	DOS	English	<b>PASS</b>
	AMI Pro for Windows	3.1	Windows	English	<b>PASS</b>
	MS Word for Windows	6.0	Windows	English	<b>PASS</b>
	Word Prefect for Windows	6.0	Windows	English	<b>PASS</b>
	WordPerfect	6.0	Windows	English	<b>PASS</b>

## 5. Performance Test

### 5.1 Introduction

To evaluate the SAHARACrystal performance and to ensure its compatibility with a complete RAGE of the most popular operating systems and software applications. FIC Motherboard R&D Team conducted a comprehensive suite of benchmark tests on the board in a variety of hardware configurations, which including a full selection of Intel Pentium II/III processors as well as SDRAM types.

In order to demonstrate realistic business application performance, Winstone 99 under Windows 98 was chosen as the primary benchmarking tool for FIC tests. Winstone 99 Version 1.0 was developed by the Ziff-Davis Publishing Company to provide a tool for accurate and realistic measurement of system performance of personal computers running popular business-oriented applications in the Microsoft Windows 98 operating system environment. To demonstrate the performance of the SAHARA Crystal in the Windows NT operating system environment, tests were also run using the Winstone 99 for Windows NT 4.0 benchmarking tool.

### 5.2 System Benchmarks Performance Summary

#### ***Benchmarks Performance for CPU in SAHARA CRYSTAL:***

The chart below illustrates the Winstone 99 under Windows 98 performance processor benchmark with the SAHARA Crystall using Intel Pentium II/III processors as below table. The following is a sample of the results using 512KB Pipeline Burst SRAM, 64MB SDRAM DRAM, with ATI Rage LT Pro AGP onboard VGA in 1024 x 768 x 16bit colors (3D WinBench 98 use 16bit color), resolution refresh rate of 85Hz, small font.

The table below provides more detailed benchmark testing data about the SAHARA Crystal using different speed Intel Pentium II/III processors. The board was configured with 512KB Pipeline Burst SRAM and 64MB SDRAM DRAM.

<b>Benchmarks</b>	<b>Weighted Suite</b>	<b>Celeron 400</b>	<b>PII 450</b>	<b>PIII 500</b>
<b>WinStone 99</b>	Business Winstone 99	<b>17.1</b>	<b>20.2</b>	<b>21.3</b>



## **6. Special Device Test**

### **6.1 Riser Card**

PART NO.	Description	O.S.	Resault
51-40521-04	RISER-CEISA SLOT V1.2 FOR SAHARA CRYSTAL	95/98/NT	PASS

### **6.2 LED Board**

PART NO.	Description	O.S.	Resault
51-40522-01	LED-B V1.1 FOR SAHARA II	95/98/NT	PASS

### **6.3 CD-ROM Board**

PART NO.	Description	O.S.	Resault
51-40539-01	CD-ROM BOARD V1.2 SAHARA II	95/98/NT	PASS